

CLAIMS:

1. A method of adapting a sample processing system for use with a selected sample processing device, the method comprising:
- providing a sample processing system that comprises:
- 5 a base plate adapted to receive a sample processing device, the base plate comprising a thermal structure;
- a drive system adapted to rotate the base plate about an axis of rotation;
- a system controller; and
- 10 connection apparatus located between the base plate and the drive system, the connection apparatus releasably attaching the base plate to the drive system for rotation of the base plate about the axis of rotation, wherein the connection apparatus comprises:
- a drive side connector fixedly attached to the drive system;
- 15 a plate side connector fixedly attached to the base plate;
- operably attaching the base plate to the drive system by mating the drive side connector with the plate side connector; and
- rotating the base plate about the axis of rotation using the drive system.
- 20 2. A method according to claim 1, further comprising identifying the base plate to the system controller.
3. A method according to claim 2, wherein identifying the base plate to the system controller comprises optically sensing indicia on the base plate.
- 25 4. A method according to claim 2, wherein the identifying comprises transmitting a base plate identity through the connection apparatus.
5. A method according to claim 4, wherein transmitting a base plate identity through the connection apparatus comprises electrically transmitting the base plate identity through electrical connectors on the drive side connector and the plate side connector.
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6. A method according to claim 4, wherein transmitting a base plate identity through the connection apparatus comprises mechanically transmitting the base plate identity through mating mechanical structures on the drive side connector and the plate side connector.
7. A method according to claim 4, wherein transmitting a base plate identity through the connection apparatus comprises optically transmitting the base plate identity through optical transmission structures on the drive side connector and the plate side connector.
8. A method according to claim 1, wherein the base plate further comprises an electrically powered device, and wherein the method further comprises providing electrical power to the electrically powered device through the drive side connector and the plate side connector of the connection apparatus.
9. A method according to claim 8, wherein providing electrical power to the electrically powered device comprises control over delivery of the electrical power by the system controller.
10. A method according to claim 8, wherein the electrically powered device comprises a thermoelectric module in thermal communication with the thermal structure on the base plate.
11. A method according to claim 8, wherein the electrically powered device comprises an electrical resistance heater in thermal communication with the thermal structure on the base plate.
12. A method according to claim 8, wherein the electrically powered device comprises a temperature sensor.

13. A method according to claim 8, wherein the electrically powered device comprises a base plate microprocessor.

14. A method according to claim 13, wherein the base plate further

5 comprises a temperature sensor, and wherein the method comprises:

providing a signal to the base plate microprocessor from the temperature sensor; and

processing the signal from the temperature sensor using the base plate microprocessor.

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15. A method according to claim 14, wherein the base plate microprocessor provides a processed signal to the system controller based on the signal received by the base plate microprocessor from the temperature sensor.

15 16. A method according to claim 15, wherein the processed signal passes through electrical connectors in the drive side connector and the plate side connector of the connection apparatus.

17. A method according to claim 1, wherein the base plate further comprises
20 a temperature sensor in thermal communication with the thermal structure, and wherein the method further comprises providing a signal from the temperature sensor to the system controller.

18. A method according to claim 17, wherein providing a signal from the
25 temperature sensor to the system controller comprises passing the signal through electrical connectors in the drive side connector and the plate side connector of the connection apparatus.

19. A method according to claim 1, wherein the base plate further comprises
30 an electrically powered device and a photovoltaic cell, and wherein the method further comprises providing electrical power to the electrically powered device from the photovoltaic cell.

20. A method according to claim 19, wherein the electrically powered device comprises a temperature sensor.

5 21. A method according to claim 19, wherein the base plate further comprises a base plate microprocessor, and wherein the method comprises:
providing electrical energy to the base plate microprocessor from the photovoltaic cell;
providing a signal to the base plate microprocessor from the temperature
10 sensor; and
processing the signal from the temperature sensor using the base plate microprocessor.

22. A method according to claim 21, wherein the base plate microprocessor
15 provides a processed signal to the system controller based on the signal received by the base plate microprocessor from the temperature sensor.

23. A method according to claim 21, wherein the processed signal passes
through electrical connectors in the drive side connector and the plate side
20 connector of the connection apparatus.

24. A method according to claim 1, wherein the base plate further comprises an electrically powered device, and wherein the method further comprises
generating electrical power to the electrically powered device by rotating a coil
25 operatively attached to the base plate through a magnetic field.

25. A method of adapting a sample processing system for use with a selected sample processing device, the method comprising:
providing a sample processing system that comprises:
30 a base plate adapted to receive a sample processing device, the base plate comprising a thermal structure, an electrically powered device, and a generator coil operatively attached to the base plate;

a drive system adapted to rotate the base plate about an axis of rotation;

a system controller; and

rotating the base plate about the axis of rotation using the drive system; and

- 5 providing a magnetic field proximate the base plate such that the generator coil passes through the magnetic field while the base plate is rotating to generate electricity that powers the electrically powered device on the base plate.

- 10 26. A method according to claim 24, further comprising identifying the base plate to the system controller.

- 15 27. A method according to claim 24, wherein the electrically powered device comprises a thermoelectric module in thermal communication with the thermal structure on the base plate.

28. A method according to claim 24, wherein the electrically powered device comprises an electrical resistance heater in thermal communication with the thermal structure on the base plate.

- 20 29. A method according to claim 24, wherein the electrically powered device comprises a temperature sensor.

30. A method according to claim 24, wherein the electrically powered device comprises a base plate microprocessor.

- 25 31. A method according to claim 29, wherein the base plate further comprises a temperature sensor, and wherein the method comprises:
providing a signal to the base plate microprocessor from the temperature sensor; and
30 processing the signal from the temperature sensor using the base plate microprocessor.

32. A method according to claim 30, wherein the base plate microprocessor provides a processed signal to the system controller based on the signal received by the base plate microprocessor from the temperature sensor.

5 33. A method according to claim 24, wherein the base plate further comprises a temperature sensor in thermal communication with the thermal structure, and wherein the method further comprises providing a signal from the temperature sensor to the system controller.

10 34. A sample processing system comprising:
a base plate adapted to receive a sample processing device on a top surface of the base plate, the base plate comprising a thermal structure exposed on the top surface of the base plate;
a drive system adapted to rotate the base plate about an axis of rotation;
15 a system controller; and
connection apparatus located between the base plate and the drive system, the connection apparatus releasably attaching the base plate to the drive system for rotation of the base plate about the axis of rotation, wherein the connection apparatus comprises a drive side connector fixedly attached to the
20 drive system and a plate side connector fixedly attached to the base plate;
wherein the plate side connector releasably mates with the drive side connector to operably attach the base plate to the drive system, whereby the drive system is capable of rotating the base plate about the axis of rotation.

25 35. A system according to claim 33, further comprising identification indicia identifying a characteristic of the base plate.

36. A system according to claim 34, wherein the identification indicia is optically readable.

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37. A system according to claim 34, wherein the identification indicia comprises mating mechanical structures on the drive side connector and the plate side connector.

5 38. A system according to claim 33, wherein the connection apparatus comprises electrical connectors on the drive side connector and the plate side connector, whereby electrical signals pass between the base plate and the system controller through the electrical connectors.

10 39. A system according to claim 33, wherein the base plate further comprises an electrically powered device, and wherein the drive side connector and the plate side connector comprise electrical power transmission structures in electrical communication with the electrically powered device.

15 40. A system according to claim 38, wherein the electrically powered device comprises a thermoelectric module in thermal communication with the thermal structure on the base plate.

20 41. A system according to claim 38, wherein the electrically powered device comprises an electrical resistance heater in thermal communication with the thermal structure on the base plate.

42. A system according to claim 38, wherein the electrically powered device comprises a temperature sensor.

25 43. A system according to claim 38, wherein the electrically powered device comprises a base plate microprocessor in communication with the electrically powered device and the system controller.

30 44. A system according to claim 38, wherein the base plate microprocessor is in communication with the system controller through electrical connectors in

the drive side connector and the plate side connector of the connection apparatus.

45. A system according to claim 33, wherein the base plate further
5 comprises a temperature sensor in thermal communication with the thermal structure, and wherein the temperature sensor is in communication with the system controller.
46. A system according to claim 44, wherein the temperature sensor is in
10 communication with the system controller through electrical connectors in the drive side connector and the plate side connector of the connection apparatus.
47. A system according to claim 33, wherein the base plate further
15 comprises an electrically powered device and a photovoltaic cell operably connected to supply electric energy to the electrically powered device.
48. A system according to claim 46, wherein the electrically powered device comprises a temperature sensor.
49. A system according to claim 33, further comprising an electromagnetic
20 energy source arranged to direct electromagnetic energy towards a bottom surface of the base plate.
50. A system according to claim 33, further comprising an electromagnetic
25 energy source arranged to direct electromagnetic energy towards the top surface of the base plate.
51. A system according to claim 33, further comprising a plurality of thermoelectric modules in thermal communication with the thermal structure.
52. A sample processing system comprising:
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a base plate adapted to receive a sample processing device on a top surface of the base plate, the base plate comprising a thermal structure, an electrically powered device, and a generator coil operatively attached to the base plate;

- 5 a drive system adapted to rotate the base plate about an axis of rotation;
 a system controller;

 connection apparatus located between the base plate and the drive system, the connection apparatus releasably attaching the base plate to the drive system for rotation of the base plate about the axis of rotation;

- 10 a magnetic field proximate the base plate, wherein the generator coil operatively attached to the base plate passes through the magnetic field when rotating the base plate about the axis of rotation using the drive system, and wherein the generator coil is operatively connected to the electrically powered device such that the generated electricity powers the electrically powered device
15 on the base plate.

53. A system according to claim 51, wherein the connection apparatus comprises electrical connectors on the drive side connector and the plate side connector, whereby electrical signals pass between the base plate and the system
20 controller through the electrical connectors.

54. A system according to claim 51, wherein the electrically powered device comprises a thermoelectric module in thermal communication with the thermal structure on the base plate.
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55. A system according to claim 51, wherein the electrically powered device comprises an electrical resistance heater in thermal communication with the thermal structure on the base plate.

- 30 56. A system according to claim 51, wherein the electrically powered device comprises a temperature sensor.

57. A system according to claim 51, wherein the electrically powered device comprises a base plate microprocessor in communication with the electrically powered device and the system controller.

- 5 58. A system according to claim 56, wherein the base plate microprocessor is in communication with the system controller through electrical connectors in the drive side connector and the plate side connector of the connection apparatus.